

"Bayesian Logic and the Maximum Entropy Method"

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Abstract

The lecture will recall first some of the information given during same School in 2007, however will illustrate Bayesian inference with a few new examples concentrated mainly on the experimental problems. These are e.g. the meaning of a "true" value, of "uncertainty", "confidence interval" etc. After several examples on the use of Bayesian reasoning which leads sometimes to counterintuitive results, we shall consider also the physics underlying very commonly used Poisson distribution. Such distribution is e.g. accepted in epidemiological studies that often result in quite uncertain values of the parameters of interest. We show how one can cope with such a problem on an example of the health of nuclear industry workers. Finally, Jaynes' principle of the Maximum Entropy will be recalled, and the use of the Maximum Entropy Method will be illustrated on the example of the Mossbauer spectroscopy.